

Use of herbicides in TRANSI

In Southern California

Herbicide sprays that could control 80%–90% of the weeds in celery fields would reduce costly hand labor.

To determine the response of weeds and of celery to various herbicides, 12 randomized block experiments were conducted in commercial celery fields in Ventura and San Diego counties during the winter and spring of 1958–59.

The most troublesome weeds in celery vary with locality and season, and include chickweed, shepherd's-purse, nightshade, pigweed, nettle, mallow and lamb's-quarters. Grass weeds are a problem only in localized areas.

Herbicides Tested

The herbicides—in 100 gallons of solution per acre—were applied directly over the beds, in a band 18" wide. Single row plots 25' long with three or four replications were used. A 20' portion was harvested from each of the experimental plots.

Stoddard solvent—a selective weed oil—at the rate of 20 gallons per acre was included in some of the tests with CDEC and CIPC, to provide contact action on

existing weeds. No oil injury was evident in Ventura County tests when the oil was properly emulsified in enough water to make 100 gallons per acre, using 20 gallons of oil per acre, alone or with CIPC. However, in the San Diego area, celery heart injury and burning of foliage were observed following a September application. Apparently considerable hazard accompanies the application of oil at any rate to celery during a period of hot weather.

Early Trials

In the early trials, post-planting applications of randox at four and eight pounds per acre; EPTC at five and 15 pounds; CDEC at four and eight pounds; and IPC at one and two pounds per acre caused no adverse effects on the celery but gave inconsistent results, with general lack of weed control. Monuron and diuron at one-half, one and two pounds per acre gave excellent weed control but were injurious to the celery, especially under conditions of high rainfall. Of these six materials, only CDEC was used in further trials.

Simazine at one-half pound per acre, post-planting, gave good weed control in the early trials. However, it caused severe stunting and chlorosis of celery in some of the tests.

Neburon, which was included in all 12 trials, was found to be an effective herbicide. In post-planting treatments it gave fair weed control at dosages as low as one-half pound per acre. In most cases, two pounds of neburon controlled more than 90% of the broadleaf weeds, and one pound consistently gave at least 70%–80% weed control. The celery showed considerable tolerance to neburon, even at higher rates of application tested.

CIPC at 4–6 pounds per acre, post-planting—with stoddard solvent added—gave from 80% to 100% control; without oil, weed control at these rates was in the range of 60%.

Timing Tests

To determine the effect of the time of herbicide application on weed control and injury to celery, two randomized block experiments were set up in the spring of 1959, in adjacent plots. In one test, herbicides were applied to the formed beds on February 10, about one week before the plants were set out, and weed counts were made on March 6. In the other, herbicides were applied on March 6, about three weeks after transplanting, and weed counts were made on April 3. Weed populations consisted mainly of shepherd's-purse, but there were some small nettle and lamb's-quarters plants.

With the pre-planting treatment, satisfactory weed control was obtained with neburon at and above two pounds per acre; with simazine at one-half pound; and with CIPC at eight pounds plus stoddard solvent at 20 gallons per acre. CDEC up to eight pounds per acre, applied with stoddard solvent, was not satisfactory.

Nearly complete weed control was obtained in all post-planting treatments. Neburon was applied at one–six pounds per acre; simazine at one-half pound;

The effect of several herbicides on weed control and yield of celery when applied pre-transplanting, February 10, and post-transplanting March 6, 1959.

Treatment lbs./acre	No. weeds per 4 feet of row		Wt. celery per plot—pounds 5-27-59	
	3-6-59 pre-plant	4-3-59 post-plant	pre-plant	post-plant
Check No. 1	25.75	20.50	96.5	96.2
Check No. 2	29.75	22.00	89.6	96.0
Neburon 1 lb.	10.50	0.00	106.5	93.2
Neburon 2 lb.	2.25	0.00	97.2	89.6
Neburon 4 lb.	1.25	0.00	102.4	88.0
Neburon 6 lb.	2.25	1.00	103.9	88.4
Simazine ½ lb.	4.00	2.00	94.2	88.4
CDEC 4 lb. + Stoddard 20 gal.	14.50	0.25	94.4	103.1
CDEC 6 lb. + Stoddard 20 gal.	14.75	0.25	95.7	99.9
CDEC 8 lb. + Stoddard 20 gal.	11.75	0.00	84.1	88.5
CIPC 2 lb. + Stoddard 20 gal.	18.75	2.25	99.1	82.2*
CIPC 4 lb. + Stoddard 20 gal.	13.50	0.00	96.6	76.1**
CIPC 6 lb. + Stoddard 20 gal.	15.25	0.25	98.0	79.7**
CIPC 8 lb. + Stoddard 20 gal.	5.75	0.00	81.9*	62.2**
L.S.D. (.05)			10.8	11.57
L.S.D. (.01)			14.3	15.40

* Significantly lower than average of two checks at the 5% level.

** Significantly lower than average of two checks at the 1% level.

PLANTED CELERY

In Northern California

Chemical weed control methods now under development promise substantial savings in the million dollar weed bill of the growers of transplanted celery in California. The general method of weed control in the coastal counties is still cultivation and hand weeding.

During the spring and summer of 1958 and of 1959, 11 different herbicides were tested in eight experiments in commercial celery fields in San Luis Obispo, Santa Clara, and San Joaquin counties. Field rows were treated either shortly before transplanting the celery or about three weeks after transplanting. All treatments were applied directly over the beds. Plots—in randomized blocks—varied from 25' to 100' long, were one bed wide, and were replicated four times in most trials. The rate of application was on the basis of active ingredients and actual area covered.

Pre-transplant Trials

Seven of the 11 herbicides were used in a pre-transplant experiment in San Luis Obispo County in 1958. The predominant weeds were small nettle, pigweed, and nightshade.

Weed control was 90% or higher with CDEC, CIPC, and neburon at eight pounds per acre and with simazine at one pound per acre. Weed control was not satisfactory with CDAA, EPTC, or IPC at any rate tested, up to 16 pounds per acre.

Simazine caused some injury to the celery crop, even at one pound per acre, and at two and four pounds the damage was severe. None of the other six herbicides caused any marked symptoms of damage, up to 16 pounds per acre.

The 1959 pre-transplant experiment in San Luis Obispo County tested five herbicides, four of which had given good weed control in 1958. The predominant weeds were mallow, pigweed, and lamb's-quarters.

Celery yields were significantly reduced by CDEC and CIPC at eight but not at six pounds per acre, and by simazine at one-half pound per acre—the only rate tested. Yields were not reduced at all by neburon up to six pounds or by Zytron—M-1329—up to 32 pounds per acre.

Weed control was not satisfactory with any of the five treatments. The failure to approach the 1958 weed control might be related to the critical interval of one week after application before transplanting and irrigation. In 1958, all the operations were completed the same day.

Post-transplant Trial

Another selection of five herbicides was tested in a post-transplant experiment in San Luis Obispo County in 1959. Weed species were mallow, pigweed, and lamb's-quarters.

Weed control was greater than 90% with CIPC at six pounds per acre plus

CIPC at two-eight pounds per acre plus stoddard solvent; and CDEC at four-eight pounds per acre also with the solvent.

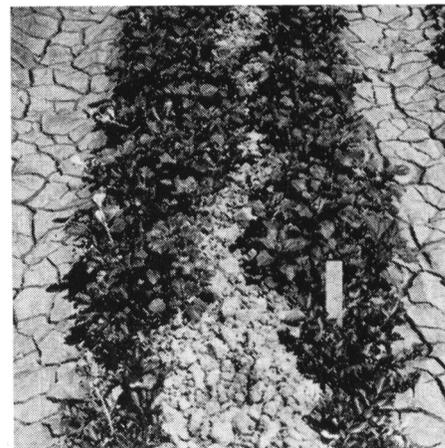
Plant Injury

However, celery yields indicated that greater injury was caused by the post-planting than by the pre-planting treatments, except in the CDEC plots. In fact, pre-planting treatments with neburon gave higher yields than the control plots. Yields from the post-planting neburon

treatments were not significantly reduced, but tended to decrease at the higher rates of application.

Yields

In early trials, no injury to the celery was observed following post-planting application of CIPC at rates up to six pounds, plus solvent. However, in 1959, the yield of celery from plots treated with CIPC plus stoddard solvent was significantly reduced at the 8-pound rate in the pre-planting treatments and at all



Weed control in transplanted celery in Santa Clara County, by Dicryl applied three weeks after transplanting. Treated area in foreground, untreated area in background.

20 gallons of selective oil, and with Dicryl—N-4556—and Karsil—N-4562—at 1.5 pounds per acre. These three treatments did not reduce crop yield or vigor. Weed control was only 87% with neburon at six pounds per acre—the highest rate tested—while four pounds per acre caused significant reduction of yield. Simazine at one-half pound per acre did not reduce yield but gave only 33% weed control.

The usefulness of Karsil and Dicryl for post-transplant weed control was confirmed in Santa Clara County, and promising results were obtained there with another herbicide, CP-10543.

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rates—from two to eight pounds per acre—in the post-planting treatments.

Celery yields following CDEC were not significantly different from yields in the control plots in either the pre- or the post-planting treatments.

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